

University of Groningen

## Clonal clusters and virulence factors of methicillin-resistant *Staphylococcus aureus*

Abimannan, Nagarajan; Sumathi, G.; Krishnarajasekhar, O. R.; Sinha, Bhanu; Krishnan, Padma

*Published in:*  
Indian journal of medical microbiology

*DOI:*  
[10.4103/ijmm.IJMM\\_18\\_271](https://doi.org/10.4103/ijmm.IJMM_18_271)

**IMPORTANT NOTE:** You are advised to consult the publisher's version (publisher's PDF) if you wish to cite from it. Please check the document version below.

*Document Version*  
Publisher's PDF, also known as Version of record

*Publication date:*  
2019

[Link to publication in University of Groningen/UMCG research database](#)

### *Citation for published version (APA):*

Abimannan, N., Sumathi, G., Krishnarajasekhar, O. R., Sinha, B., & Krishnan, P. (2019). Clonal clusters and virulence factors of methicillin-resistant *Staphylococcus aureus*: Evidence for community-acquired methicillin-resistant *Staphylococcus aureus* infiltration into hospital settings in Chennai, South India. *Indian journal of medical microbiology*, 37(3), 326-336. [https://doi.org/10.4103/ijmm.IJMM\\_18\\_271](https://doi.org/10.4103/ijmm.IJMM_18_271)

### **Copyright**

Other than for strictly personal use, it is not permitted to download or to forward/distribute the text or part of it without the consent of the author(s) and/or copyright holder(s), unless the work is under an open content license (like Creative Commons).

The publication may also be distributed here under the terms of Article 25fa of the Dutch Copyright Act, indicated by the "Taverne" license. More information can be found on the University of Groningen website: <https://www.rug.nl/library/open-access/self-archiving-pure/taverne-amendment>.

### **Take-down policy**

If you believe that this document breaches copyright please contact us providing details, and we will remove access to the work immediately and investigate your claim.

*Downloaded from the University of Groningen/UMCG research database (Pure): <http://www.rug.nl/research/portal>. For technical reasons the number of authors shown on this cover page is limited to 10 maximum.*

## Record: 1

**Title:** Clonal clusters and virulence factors of methicillin-resistant : Evidence for community-acquired methicillin-resistant infiltration into hospital settings in Chennai, South India.

**Authors:** Abimannan, Nagarajan<sup>1,2</sup>  
Sumathi, G.<sup>3</sup>  
Krishnarajasekhar, O. R.<sup>4</sup>  
Sinha, Bhanu<sup>5,6</sup>  
Krishnan, Padma<sup>1</sup>

**Source:** Indian Journal of Medical Microbiology. Jul-Sep2019, Vol. 37 Issue 3, p326-336. 11p.

**Document Type:** Article

**Subject Terms:** \*METHICILLIN-resistant staphylococcus aureus  
\*NOSOCOMIAL infections  
\*COMMUNITY-acquired infections  
\*EPIDEMIOLOGY  
\*IMMUNOCOMPROMISED patients  
\*MICROBIAL sensitivity tests

**Author-Supplied Keywords:** Community-acquired methicillin-resistant Staphylococcus aureus  
HIV  
hospital-acquired methicillin-resistant Staphylococcus aureus  
innate immune evasions  
microbial surface component recognising adhesive matrix molecules  
MLST  
spa typing  
ST 772

**Abstract:** <bold>Background and Objective: </bold>Staphylococcus aureus is one of the major pathogens of nosocomial infections as well as community-acquired (CA) infections worldwide. So far, large-scale comprehensive molecular and epidemiological characterisation of S. aureus from very diverse settings has not been carried out in India. The objective of this study is to evaluate the molecular, epidemiological and virulence characteristics of S. aureus in both community and hospital settings in Chennai, southern India.  
<bold>Methods: </bold>S. aureus isolates were obtained from four different groups (a) healthy individuals from closed community settings, (b) inpatients from hospitals, (c) outpatients from hospitals, representing isolates of hospital-community interface and (d) HIV-infected patients to define isolates associated with the immunocompromised. Antibiotic susceptibility testing, multiplex polymerase chain reactions for detection of virulence and resistance determinants, molecular typing including Staphylococcal cassette chromosome mec (SCCmec) and agr typing, were carried out. Sequencing-based typing was done using spa and multilocus sequence typing (MLST) methods. Clonal complexes (CC) of hospital and CA methicillin-resistant S. aureus (MRSA) were identified and compared for virulence and resistance.<bold>Results

and Conclusion: **A** total of 769 isolates of *S. aureus* isolates were studied. The prevalence of MRSA was found to be 7.17%, 81.67%, 58.33% and 22.85% for groups a, b, c and d, respectively. Of the four SCCmec types (I, III, IV and V) detected, SCCmec V was found to be predominant. Panton-Valentine leucocidin toxin genes were detected among MRSA isolates harbouring SCCmec IV and V. A total of 78 spa types were detected, t657 being the most prevalent. 13 MLST types belonging to 9 CC were detected. CC1 (ST-772, ST-1) and CC8 (ST238, ST368 and ST1208) were found to be predominant among MRSA. CA-MRSA isolates with SCCmec IV and V were isolated from all study groups including hospitalised patients and were found to be similar by molecular tools. This shows that CA MRSA has probably infiltrated into the hospital settings. [ABSTRACT FROM AUTHOR]

*Copyright of Indian Journal of Medical Microbiology is the property of Wolters Kluwer India Pvt Ltd and its content may not be copied or emailed to multiple sites or posted to a listserv without the copyright holder's express written permission. However, users may print, download, or email articles for individual use. This abstract may be abridged. No warranty is given about the accuracy of the copy. Users should refer to the original published version of the material for the full abstract. (Copyright applies to all Abstracts.)*

**Author Affiliations:** <sup>1</sup>Department of Microbiology, University of Madras, Chennai, Tamil Nadu, India  
<sup>2</sup>Department of Microbiology, Food Analysis Laboratory, Tamil Nadu Food Safety and Drugs Administration, Madurai, Tamil Nadu, India  
<sup>3</sup>Institute of Microbiology, Rajiv Gandhi Government General Hospital, Chennai, Tamil Nadu, India  
<sup>4</sup>Department of Thoracic Medicine, Government Hospital of Thoracic Medicine, Chennai, Tamil Nadu, India  
<sup>5</sup>Institute for Hygiene and Medical Microbiology, University of Wuerzburg, Wuerzburg, Germany  
<sup>6</sup>Department of Medical Microbiology, University Medical Center, Groningen, Netherlands

**ISSN:** 0255-0857

**DOI:** 10.4103/ijmm.IJMM\_18\_271

**Accession Number:** 141462678

**Database:** Academic Search Premier